

I claim:

1. An array of LED emitters, comprising:

at least first and second rows of LED emitters disposed on a substrate and electrically coupled together in a circuit, the rows separated by a first predetermined spacing, the LED emitters in each row having predetermined emission beam widths, and the emission axis of each LED emitter parallel with the emission axes of the other LED emitters in the same row;

wherein the emission axes of the LED emitters of the second row are oriented at a predetermined non-zero angle relative to the emission axes of the first row of LED emitters; and

each LED emitter in each row of LED emitters is separated from an adjacent LED emitter by a second predetermined spacing.

2. The array of LED emitters of claim 1, wherein the emission beam widths of all of the LED emitters are substantially uniform.

3. The array of LED emitters of claim 1, wherein the predetermined non-zero angle is a defined fraction of the emission beam width of an individual LED emitter.

4. The array of LED emitters of claim 1, wherein the predetermined non-zero angle is approximately one-quarter of the emission beam width of the LED emitters.

5. The array of LED emitters of claim 1, wherein the predetermined non-zero angle is variable.

6. The array of LED emitters of claim 1, wherein adjacent rows of LED emitters are disposed on separate respective elongated substrates hinged together along their adjacent edges.

7. The array of LED emitters of claim 1, wherein the LED emitters are semiconductor light emitting diodes.
8. The array of LED emitters of claim 1, wherein the LED emitters are incandescent light emitting devices.
9. The array of LED emitters of claim 1, wherein the LED emitters are light emitting devices that emit light of visible wavelengths.
10. The array of LED emitters of claim 1, wherein the LED emitters are light emitting devices that emit light of ultraviolet wavelengths.
11. The array of LED emitters of claim 1, wherein the LED emitters are light emitting devices that emit light of infrared wavelengths.
12. The array of LED emitters of claim 1, further comprising an electrical drive circuit, coupled to the circuit of LED emitters, which provides a pulsating direct current sufficient to drive the LED emitters to a maximum peak intensity.
13. The array of LED emitters of claim 11, wherein the electrical drive circuit operates from an AC power source without requiring an isolation or step down transformer.
14. The array of LED emitters of claim 11, wherein the electrical drive circuit operates from a DC power source.
15. The array of LED emitters of claim 1, wherein an illumination pattern provided by the array of LED emitters is adjustable to a variable target distance.
16. The array of LED emitters of claim 1, wherein an illumination pattern provided by the array of LED emitters is adaptable to a range of illumination densities from focused to diffused.

17. The array of LED emitters of claim 1, wherein the rows of LED emitters are substantially straight rows.
18. The array of LED emitters of claim 1, wherein the rows of LED emitters are non-straight rows.
19. The array of LED emitters of claim 1, wherein the rows of LED emitters are circular.
20. The array of LED emitters of claim 1, wherein the rows of LED emitters are aligned along one or more closed plane figures.
21. The array of LED emitters of claim 1, further comprising at least three rows of LED emitters.
22. The array of LED emitters of claim 21, wherein the predetermined non-zero angle is variable and each row of LED emitters is disposed on an elongated substrate separate from and coupled by a hinge to an elongated substrate of an adjacent row of LED emitters.
23. The array of LED emitters of claim 1, wherein the first predetermined spacing and the second predetermined spacing are at least greater than a diameter of an individual LED.
24. The array of LED emitters of claim 1, wherein the plurality of LED emitters in the LED circuit is electrically connected in a series configuration.
25. The array of LED emitters of claim 1, wherein the plurality of LED emitters in the LED circuit is electrically connected in a series-parallel configuration.
26. The array of LED emitters of claim 1, wherein the plurality of LED emitters in the LED circuit is electrically connected in a parallel configuration.

27. An LED task light, comprising:

an array of LED emitters, each LED emitter (LED) having an emission beam width and mounted on a substrate including:

a plurality of LEDs electrically connected in an LED circuit and disposed in at least first and second parallel columns, each column defining an LED emitter axis wherein the LED emitter axis of the first column of LEDs is oriented perpendicular to the substrate;

each column separated on the substrate from an adjacent column by a first predetermined spacing;

each LED in each column separated on the substrate from an adjacent LED in the column by a second predetermined spacing, and

each column of LEDs oriented in a direction displaced by a predetermined non-zero angle relative to the LED orientation in an adjacent column;

wherein the predetermined non-zero angle is a defined fraction of the emission beam width of an individual LED;

an electrical drive circuit connected to the LED circuit, mounted on the substrate and providing a pulsating DC voltage sufficient to drive the LEDs in the LED circuit to a maximum peak intensity; and

a light-transmissive housing for enclosing and supporting the substrate having the LED array and the electrical drive circuit.

28. The LED task light of Claim 25, wherein the array of LEDs comprises first, second and third parallel columns of LEDs disposed in an emission plane.

29. The LED task light of claim 28, wherein the emission plane comprises:

first, second and third elongated substrates respectively supporting the first, second and third columns of LEDs, wherein adjacent elongated substrates are coupled together by a hinge along their adjacent edges.

30. The LED task light of Claim 27, wherein each column of LEDs includes at least three rows of LEDs in the array.

31. The LED task light of Claim 27, wherein the first predetermined spacing and the second predetermined spacing each respectively exceed the diameter of an individual LED.

32. The LED task light of Claim 27, wherein the predetermined angle is substantially equal to one-quarter of the emission beam width of an individual LED.

33. The LED task light of claim 27, wherein the predetermined non-zero angle is variable and each column of LED emitters is disposed on an elongated substrate separate from and coupled by a hinge to an elongated substrate of an adjacent column of LED emitters.

34. The LED task light of Claim 27, wherein the plurality of LEDs in the LED circuit is electrically connected in a series configuration.

35. The LED task light of Claim 27, wherein the plurality of LEDs in the LED circuit is electrically connected in a series-parallel configuration.

36. The LED task light of Claim 27, wherein the electrical drive circuit operates from an alternating current power source without requiring an isolation or step-down transformer.

37. The LED task light of Claim 27, wherein the electrical drive circuit operates from a direct current power source.

38. The LED Task light of Claim 27, wherein the housing is formed of a transparent or translucent plastic material in a tubular configuration.

39. The LED task light of Claim 38, wherein the housing is configured with end caps.

40. The LED task light of Claim 38, wherein the housing is configured with a support device.

41. The LED task light of Claim 27, wherein the array of LEDs provides a substantially uniform illumination pattern at a predetermined target distance.

42. The LED task light of Claim 27, wherein an illumination pattern provided by the array of LEDs is adjustable to a variable target distance.

43. The LED task light of Claim 27, wherein an illumination pattern provided by the array of LEDs is adaptable to a range of illumination densities from focused to diffused.

44. The LED task light of Claim 27, wherein an LED is a semiconductor light emitting diode.

45. The LED task light of Claim 27, wherein an LED is an incandescent light emitting device.

46. The LED task light of Claim 27, wherein an LED is a light emitting device that emits light of visible wavelengths.

47. An LED light source assembly, comprising:

a substrate defining an emission plane;

a first plurality of LED emitters mounted on the substrate, arranged in a first line such that the emission axes of all LED emitters in the first line are parallel and disposed in a first plane defined by the first line and the parallel emission axes of the first plurality of LED emitters; and

a second plurality of LED emitters mounted on the substrate, arranged in a second line parallel to the first line and offset by a first predetermined spacing from the first line such that the emission axes of all LED emitters in the second line are parallel and disposed in a second plane defined by the second line and the parallel axes of the second plurality of LED emitters; wherein

the second plane is disposed at a predetermined non-zero angle relative to the first plane.

48. The LED light source assembly of Claim 47, further comprising:

a third plurality of LED emitters mounted on the substrate, arranged in a third line parallel to the first line and offset by a second predetermined spacing from the first line such that the emission axes of all LED emitters in the third line are parallel and disposed in a third plane defined by the third line and the parallel axes of the third plurality of LED emitters; wherein

the third plane is positioned on the opposite side of the first plurality of LED emitters from the second plurality of LED emitters and disposed at the predetermined non-zero angle relative to the first plane.

49. The LED light source assembly of Claim 48, wherein the predetermined non-zero angle is substantially equal to one-quarter of the emission beam width of an individual LED emitter.

50. The LED light source assembly of claim 48, wherein the predetermined non-zero angle is variable.

51. The LED light source of claim 50, wherein each line of LED emitters is disposed on an elongated substrate separate from and coupled by a hinge to an elongated substrate of an adjacent line of LED emitters.

52. The LED light source assembly of Claim 48, wherein each plurality of LED emitters includes at least three LED emitters.

53. The LED light source assembly of Claim 48, wherein the first predetermined spacing and the second predetermined spacing each respectively exceed a diameter of an individual LED emitter.

54. The LED light source assembly of Claim 48, wherein the first, second and third pluralities of LED emitters are electrically connected together in a series configuration.

55. The LED light source assembly of Claim 48, wherein the first, second and third pluralities of LED emitters are electrically connected together in a series-parallel configuration.

56. The LED light source assembly of claim 48, wherein the first, second and third pluralities of LED emitters are electrically connected together in a parallel configuration.

57. The LED light source assembly of Claim 48, wherein an LED is a semiconductor light emitting diode.

58. The LED light source assembly of Claim 48, wherein an LED is an incandescent light emitting device.

59. The LED light source assembly of Claim 48, wherein an LED is a light emitting device that emits light of visible wavelengths.



60. The LED light source assembly of Claim 48, wherein an LED is a light emitting device that emits light of wavelengths outside a range of wavelengths visible to human eyesight.